

Central Valley Regional Water Quality Control Board
7/8 June 2012 Board Meeting

Response to Comments for the El Dorado Irrigation District
Camino Heights Wastewater Treatment Facility
Tentative Waste Discharge Requirements

The following are Central Valley Regional Water Quality Control Board staff responses to comments submitted by interested parties regarding the tentative Waste Discharge Requirements (WDRs) for the El Dorado Irrigation District's Camino Heights Wastewater Treatment Facility (WWTF). Comments were required to be submitted to the Central Valley Water Board by 5:00 p.m. on 27 April 2012. Comments were received from the El Dorado Irrigation District (EID) and the Central Valley Clean Water Association (CVCWA) on 27 April 2012. The comments were accepted into the record. The comments are summarized below and followed by staff's response, except where staff concurred with the comment and revised the tentative WDRs. The full text of all comment letters is provided in the agenda package.

EL DORADO IRRIGATION DISTRICT's COMMENTS

EID Comment No. 1: Finding 14 presents a summary of effluent electrical conductivity (EC) data that are not representative of effluent that is discharged to the land application areas (LAAs). There are typically four months of the year when effluent is not applied to the LAAs. For the last several years, EID continued sampling effluent from the chlorine contact tank monthly when effluent was not being applied to the LAAs. Although no discharges to LAAs were occurring, EID continued to add chlorine to the contact basin for algae control, resulting in significant EC increases in the relatively small volume of water stored there. However, this effluent was never applied to the LAAs, but was returned to the treatment ponds prior to resumption of land application. When the non-representative data are removed, the average effluent EC for the last three years (September 2009 through November 2011) [sic] is 741µmhos/cm.

RESPONSE: Finding 13 was revised to include this new information and revise the tabulated effluent EC data as requested. However, the revised average effluent EC value is 794 µmhos/cm because the table in Finding 13 summarized data from September 2009 through November 2011, whereas EID's calculation was actually based on data from January 2009 through December 2011. Based on a reported community water supply hardness of 16 mg/L as calcium carbonate and an EC of 64 µmhos/cm, it is unlikely that residents use water softener. Therefore, the incremental salinity increase is far higher than would be expected. As noted in the findings, it appears that most of the increase occurs while the wastewater resides in the treatment system. Specifically, the average influent EC was 471 µmhos/cm. Comparison of this value to the corrected average effluent EC of 794 µmhos/cm shows an increase of about 320 µmhos/cm, which is greater than would be expected from evapoconcentration and the addition of sodium hypochlorite to disinfect the effluent.

EID Comment No. 2: The tentative Order proposes an effluent EC limitation based on an incremental increase of 500 µmhos/cm over source water, which results in a proposed effluent

limitation of 600 µmhos/cm. EID disagrees with this proposed effluent limitation for several reasons:

- a. An effluent limitation based on 500 µmhos/cm over source water is not a proper effluent limitation and has no credible scientific basis. This proposed effluent limitation actually derives from the Water Quality Control Plan for the Tulare Lake Basin (Tulare Lake Basin Plan), which is not applicable here. Further, the basis for the effluent limitation in the Tulare Lake Basin Plan is also not supported by credible scientific evidence.
- b. The effluent does not have the potential to degrade groundwater above the applicable water quality standard.
- c. In the recently adopted WDRs for the City of Plymouth's Wastewater Treatment facility, the Board determined that it was unlikely that the discharge would cause an exceedance of the applicable water quality objectives. EID's circumstances are similar to Plymouth's.

EID states that the effluent limitation of 600 µmhos/cm for EC should be removed or at least changed to the low-end range of the Secondary MCL of 900 µmhos/cm.

RESPONSE:

- a. Staff did not cite the Tulare Lake Basin Plan as the rationale for the effluent EC limit. However, it is not correct to state that there is no credible scientific basis for the initially-proposed effluent limitation, or for the one set forth in the Tulare Lake Basin Plan. Metcalf and Eddy¹ states that a typical mineral increase associated with domestic water use is 150 to 380 mg/L as TDS when there is no commercial or industrial discharges and no water softener usage (which translates roughly to an EC increment of 230 to 590 µmhos/cm). The 600 µmhos/cm effluent EC limit was selected as a performance-based limit based on staff's belief that the EC increase that apparently occurs during residence time in the treatment system is a controllable factor, and the tentative WDRs provided a two-year time schedule for EID to comply with that limit. Based on EID's Comment No. 1, it appears that there is a plausible explanation for the EC increase that can be controlled by EID. As stated in the response to Comment No. 1, Board staff believes that further optimization of the treatment and disinfection system will allow the effluent salinity to be further reduced. Regardless, the effluent limit was increased to 900 µmhos/cm as an annual average, and the time schedule for compliance was removed. The findings have also been revised to reflect that EID, like all dischargers in the region, is expected to do whatever it reasonably can do to reduce the salinity of the wastewater, and that future revisions of the WDRs may contain more stringent effluent limits.
- b. The findings of the tentative WDRs did not state that the discharge threatened to cause an exceedance of a water quality objective for salinity. However, it should be noted that the Basin Plan contains a water quality objective for toxicity which states that, "[g]round waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, *plant*, animal, or aquatic life associated

¹ Wastewater Engineering: Treatment, Disposal, and Reuse (3rd Edition), Metcalf & Eddy, Inc., Revised by George Tchobanoglous and Franklin L. Burton. McGraw Hill, Inc., 1991

with designated beneficial use(s)", and a water quality objective for chemical constituents which states that, "[g]round waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses." These water quality objectives require the Board to protect the agricultural beneficial use of groundwater, so the site-specific water quality objective for EC is not necessarily defined by the secondary MCL. The most stringent numeric interpretation of these objectives is usually cited as 700 $\mu\text{mhos/cm}$, which is protective of salt-sensitive crops (plant life that is associated with the AGR beneficial use), and this is less than the current average effluent EC of 794 $\mu\text{mhos/cm}$. However, the findings of the tentative Order were revised to explain that the Board does not have sufficient site-specific data to demonstrate that a 700 $\mu\text{mhos/cm}$ limit would not be overly protective, as the Board does not know what crops are or could be grown in the area (if salt-sensitive crops are not grown in the area, or if farming practices are employed that do not require high-quality groundwater even for the production of salt-sensitive crops, then the limit would be overly protective). The tentative Order was revised to require that EID complete a study to support future definition of a site-specific water quality objective for EC based on consideration of all beneficial uses of groundwater.

- c. As noted above, effluent and groundwater limits are developed on a case- and site-specific basis. The City of Plymouth uses a similarly low salinity water supply and the salinity of their treated effluent WWTF is similar to that of Camino Heights. However, in the case of Plymouth, there is evidence that background groundwater salinity is greater than the salinity of the effluent, and there was no evidence of increases associated solely with residence time within the treatment system. Additionally, the City of Plymouth had recently improved the quality of its water supply and completed other capital improvements to protect water quality.

EID Comment No. 3: An effluent salinity reduction workplan should not be required because the levels of salinity in the effluent as reported in the monitoring data are not representative as noted above. Also, the facility serves a small community with 121 sewer connections, and a small number of businesses. There are no industrial dischargers. EID has evaluated operations at the WWTF and has already reduced salinity by controlling chlorine dosing and installing a Supervisory Control and Automated Data Acquisition (SCADA) system.

RESPONSE: As discussed in the response to Comment No. 1, the corrected average effluent EC averages 794 $\mu\text{mhos/cm}$, and ranges from 320 $\mu\text{mhos/cm}$ to 1,900 $\mu\text{mhos/cm}$, while the water supply has an average EC of 64 $\mu\text{mhos/cm}$. As discussed in the response to Comment No. 1, the EC of the wastewater increases by about 320 $\mu\text{mhos/cm}$ after it reaches the wastewater treatment facility, which is greater than the increase that would be expected from evapoconcentration and the addition of sodium hypochlorite to disinfect the effluent. Therefore, Board staff believes that requiring EID to implement a Effluent Salinity Reduction Workplan is appropriate, as EID should investigate whether there are any controllable EC increases that occur at the WWTF. If EID demonstrates that the salinity increase cannot reasonably be reduced, then no further action would be required.

EID Comment No. 4: The findings cite the Basin Plan's numeric water quality objective of 2.2 MPN over any seven-day period for coliform organisms and incorrectly state that the Tentative Order sets an effluent limitation of 2.2 MPN/100 mL for total coliform organisms. In actuality, the Tentative Order proposes an effluent limitation of 23 MPN as a seven-day median concentration. EID objects to this for the following reasons:

- a. The findings must be consistent with the limitations, and must support the limitations proposed.
- b. The effluent limitation for total coliform should be revised to be a monthly median of 23 MPN/100 mL versus the seven-day median to be consistent with EID's current WDRs as well as other permits recently adopted (specifically, the City of Plymouth).
- c. The Tentative Order includes a groundwater limitation for total coliform organisms based on the Basin Plan's numeric objective of 2.2 MPN/100 mL for coliform organisms. The Basin Plan does not differentiate between total and fecal coliform organisms. EID believes that the limitation should be based on fecal, not total coliform organisms because fecal coliform is a much more reliable indicator of sewage contamination. EID goes on to say that coliform organisms are common throughout the environment and reliance on this as an indicator of human waste would likely cause a false positive result, citing EID's own groundwater monitoring data for both fecal and coliform organisms as evidence of that possibility. EID further states that the Board took this approach for the City of Vacaville in Order R5-2008-0055-01.

RESPONSE:

- a. The findings incorrectly stated that the effluent limit was set at 2.2 MPN/100mL. This error has been corrected.
- b. The effluent limitation for total coliform was revised as requested to be a monthly median of 23 MPN/100 mL.
- c. It is correct that the Basin Plan does not use the term "total coliform organisms", but "coliform organisms" in the water quality objectives for Bacteria. It is true that fecal coliform is a more reliable indicator of fecal contamination, but it is not a definitive test for the presence of human waste, either. Notwithstanding the groundwater limitations for the City of Vacaville in Order R5-2008-0055-01 (which may have been a simple error), the Board has consistently adopted WDRs that limit total coliform organisms to 2.2 MPN/100 mL in groundwater. There is no evidence that the Board ever intended to limit the water quality objective to fecal coliform organisms, so the requested change was not made.

It should be noted that 2.2 MPN/100 mL is the analytical reporting limit for both total and fecal coliform organisms. Therefore, the Basin Plan essentially prohibits any coliform organisms in groundwater. It is not surprising that EID has experienced few detections of fecal coliform in groundwater samples, because fecal coliform is usually only a small fraction of total coliform present in the environment. This effect can be seen even in coliform tests performed on undisinfected wastewater: total coliform counts are usually several orders of magnitude greater than the fecal coliform counts. The fact that fecal

coliform organisms are detected in groundwater at the WWTF site at all is a concern, and it is appropriate to require EID to take action to address these detections.

EID Comment No. 5: Finding 34.e makes generalized conclusions that are not supported by evidence in the record in stating, "[t]he groundwater coliform detections are likely due to the wastewater percolation from the unlined ponds or cross-contamination of the monitoring wells during construction and/or subsequent sampling." EID should be allowed to evaluate the potential sources of coliform in the downgradient monitoring wells. Based on the low, infrequent fecal coliform detections in shallow groundwater, EID does not believe a well disinfection work plan is warranted and the requirement to submit one should be deleted.

RESPONSE: As stated in the findings of the tentative Order, coliform organism ordinarily should not be present in groundwater. The fact that coliform organisms are present in low numbers in groundwater at the Camino Heights WWTF is highly suggestive of cross-contamination with native soil during well construction or from less-than-sterile conditions during quarterly groundwater sampling. The problem has been noted in many cases throughout the region, has been corroborated by several consulting geologists, and it has been our experience that coliform detections in groundwater often resolve after well disinfection and sanitary sampling techniques are implemented. The intent of requiring the well disinfection workplan and sampling and analysis plan was to give EDI an opportunity to "start fresh" rather than assume fecal contamination from the WWTF.

EID Comment No. 6: If the Board decides to require well disinfection, EID requests that the workplan due date be changed to March 1, 2013 and the other associated deadlines be changed to 1 September 2013 and 1 October 2013, respectively.

RESPONSE: The tentative Order has been revised to allow more time to prepare the workplan and complete the well disinfection as requested.

EID Comment No. 7: If coliform detections in groundwater recur after monitoring well disinfection, the Tentative Order would require EID to perform additional treatment or control, including the installation of pond liners. This is inappropriate for a number of reasons:

- a. It presumes that if total coliform detections occur after well disinfection, it must be the result of pond leakage, but the requirement is not supported with specific findings based on evidence in the record.
- b. The requirement could also trigger the need for costly treatment plant upgrades based on one detection of total coliform. If the costs for such upgrades were allocated directly to those served, the sewer rates would be extraordinarily high.
- c. Considering that total coliform is not a good indicator of sewage contamination, and that fecal coliform data indicates compliance with applicable water quality standards, it is inappropriate and unreasonable to include such a requirement.

RESPONSE:

- a. Staff does not presume that recurrence of coliform detections after well disinfection and diligent attention to sanitary sampling techniques would be due to leakage from the unlined wastewater treatment ponds. However, it should be noted that the ponds would be the most likely source by far because the ponds are unlined, there is a limited amount of soil below the base of the ponds to filter microbes, and there is a constant hydraulic head on the pond bottoms that serves as a physical driver to force wastewater into the underlying fractured bedrock. Any other potential source such as a septic leach field or wildlife presents a much lower probability because the factors noted above favor movement of waste constituents, including bacteria, into groundwater. Nevertheless, the tentative Order has been revised to allow EID to demonstrate that the source of any recurrent coliform detections in groundwater is not the result of wastewater percolating from the unlined ponds.
- b. Pond lining systems are an obvious and increasingly common solution to groundwater quality issues associated with unlined wastewater treatment and storage ponds, and the cost of this, or any other solution, has not been shown to be unreasonable. Nevertheless, it was not staff's intent to force a particular solution on the District. The tentative Order clearly stated that pond liners were an acceptable alternative rather than the only solution should coliform detections in groundwater recur. Nevertheless, the tentative Order has been revised to clarify that any effective form of treatment or control would be acceptable.
- c. The fact that total and fecal coliform detections in groundwater have not been consistent from quarter to quarter does not mean that the water quality objective has not been violated. In fact, the temporal variability suggests that the coliform-impacted groundwater may readily move through the aquifer. As noted above, the fact that fecal coliform has been detected in groundwater at all is a concern. Unless EID can show that recurring coliform detections are not caused by the WWTF, it is reasonable to require additional treatment or control measures to ensure compliance with the Basin Plan and Resolution 68-16.

EID Comment No. 8: The Tentative Order includes a proposed groundwater limitation that would prohibit groundwater from containing waste constituents in concentrations statistically greater than current groundwater quality, and compliance with this limitation would be determined using approved intrawell statistical methods. EID objects to this requirement because they believe that:

- a. The groundwater limitation would prohibit any increase in background quality even if applicable water quality objectives were not exceeded.
- b. Setting groundwater limitations equal to existing water quality is not consistent with the law where the groundwater may be considered high-quality.
- c. The discharge is consistent with Resolution 68-16.

- d. The proposed WDRs (with the modifications proposed by EID) results in best practicable treatment or control. The proposed effluent limitations and other constituent-specific groundwater limitations ensure that groundwater quality is protected.
- e. The proposed groundwater limitation is not consistent with the Board's approach for establishing groundwater limitations for other similar cases (specifically, WWTFs owned by the City of Plymouth, Shasta College, and Copper Cove).

RESPONSE:

- a. The Groundwater Limitations do not prohibit increases in background groundwater quality. In fact the Monitoring and Reporting Program does not require sampling and analysis of groundwater from the background well. The Groundwater Limitations were revised to clarify this. The tentative Order requires intrawell statistical analysis for the downgradient wells only. EID may have misunderstood the concept of intra-well analysis, which is used to evaluate groundwater concentrations in a single well over time to determine whether there are significant increases or violations of the groundwater limitations. Intra-well analysis does not compare water quality in downgradient wells with background groundwater quality. It is appropriate to use intra-well analysis in this case because the onsite background monitoring well does not appear suitable to provide samples that are representative of background groundwater quality.
- b. In accordance with the Water Code, Resolution 68-16, and the Basin Plan, the Board has the authority to set groundwater limitations for any constituent which is present in, or reasonably expected to result from, the discharge. As per the Basin Plan, groundwater limits established in WDRs do not require improvement over ambient background groundwater quality. For high-quality water, in order to comply with Resolution 68-16, the Board may not set groundwater limits that allow degradation beyond any applicable water quality objective. However, the Board is not obligated to allow for the utilization of all of the assimilative capacity of the receiving water, and the Board must first make certain findings (that a discharger employs best practicable treatment or control of the constituents of concern, that any degradation is to the maximum benefit of the people of the state) prior to allowing any degradation to occur. The decision to allow even a limited amount of degradation to occur is made on a case-by-case basis, after the Board considers the water quality objectives, the beneficial uses, and the factors mentioned above. In this case, staff is recommending that the Board allow degradation to occur up to the water quality objectives, except for EC. In the case of EC, the discharge has been occurring for several years and it is likely that degradation from this salinity indicator is now at a steady state. The clear intent of the proposed Order is to allow the EC degradation that may have occurred, but not to allow any increase beyond the degradation that may exist today. The requirement is a reasonable one.
- c. As stated in Findings 43 through 48 of the proposed Order, EID provides some treatment and control that may be sufficient to comply with Resolution 68-16. However, because of the unresolved detection of coliform organisms in groundwater, it is not

appropriate to conclude that no further treatment and control is needed unless the work and studies required by the Provisions of the proposed Order show that either: a) the coliform detections are resolved, or b) they are not caused by the discharge.

- d. As noted in the responses to Comment Nos. 7 and 8.d above, some additional work is needed to determine whether EID's current efforts represent best practicable treatment or control.
- e. Although we strive for consistency in WDRs across the region, no two cases are identical in terms of receiving water quality, discharge quality, site-specific conditions that determine the overall threat to water quality, or socio-economic considerations. Therefore it is not reasonable to expect that all WDRs will contain the same antidegradation analysis or groundwater limitations. For instance, the tentative WDRs for Shasta College state:
 - There are no functioning groundwater monitoring wells at the site so groundwater quality is not known. This is not the case for EID's Camino Heights WWTF;
 - The Shasta College wastewater treatment ponds all have some form of lining system, whereas EID's pond are not lined;
 - Because groundwater quality at Shasta College is not known, the groundwater limitations in the tentative WDRs were set at the most stringent potentially applicable water quality objective or background, whichever is greater. The Camino Heights WWTF has groundwater monitoring wells and they exhibit evidence of degradation from coliform organisms.

For these reasons, the groundwater limitations for the two facilities are not the same, and no revisions were made to address this comment.

EID Comment No. 9: Discharge specification B.12.d would require consultation with the local Mosquito Abatement District. Such consultation is not necessary because EID manages the ponds in an appropriate manner to prevent breeding of mosquitoes. This requirement should be deleted.

RESPONSE: This standard requirement is not overly burdensome and is included in the interest of public health and nuisance prevention. We recognize that EID may have the capability to manage mosquitoes adequately without assistance. Discharge Specification B.9 does not automatically require consultation with the Mosquito Abatement District; it requires consultation *as needed* [emphasis added]. In order to clarify the intent, Discharge Specification B.9.d was revised slightly to emphasize that consultation is only required if needed.

EID Comment No. 10:

- a. Effluent monitoring should only be required when effluent is being applied to the LAAs.

- b. With respect to total coliform monitoring, EID requests that the sampling frequency be changed from daily to weekly.
- c. With respect to TDS, chloride, and total nitrogen, EID requests that the sampling frequency be changed from monthly to annually like the standard minerals.

RESPONSE:

- a. The MRP been revised to require effluent monitoring only during months when effluent is disinfected and discharged to the land application areas.
- b. The effluent coliform sampling frequency was changed as requested and the Effluent Limitations were revised so that compliance with the effluent coliform limitation will be determined based on the median of all samples obtained in a calendar month.
- c. The frequency of effluent TDS and chloride monitoring was changed from monthly to annually. However, the frequency of EC monitoring was increased to weekly during periods of discharge to the LAAs so that there are sufficient samples each year to determine compliance with the annual average effluent EC limit. Because EID will be sampling for total coliform organisms weekly during discharge, adding EC testing will not add significantly to the cost of monitoring. Also, effluent EC monitoring can be performed by a plant operator using an inexpensive hand-held meter, thereby avoiding laboratory costs altogether.

EID Comment No. 11: The Monitoring and Reporting Program would require EID to continue quarterly groundwater monitoring for an additional two years and then the sampling frequency would decrease to semi-annual. EID has been conducting quarterly monitoring since 2003 and it is not necessary to continue quarterly monitoring for another two years.

RESPONSE: Because coliform organisms have been detected in groundwater at the site, quarterly groundwater monitoring for another two years is needed to assess the effectiveness of the monitoring well disinfection and improved groundwater sampling techniques. The requirement for quarterly groundwater monitoring will revert automatically to semi-annual after another two years of quarterly monitoring.

EID Comment No. 12: The groundwater monitoring requirement for total coliform organisms should be changed to fecal coliform organisms based on the previous comment.

RESPONSE: The responses to Comment Nos. 4.c and 5 explain why the proposed Order was not revised as requested.

EID Comment No. 13: The District is concerned with budget impacts that the WDRs would cause. The District approved a 50 percent sewer rate increase over several years and laid off 45 people since mid-2008. The District also eliminated several positions through attrition since 2008, resulting in a 26 percent staff reduction. The District has invested over \$1 million in improvements at the Camino Heights WWTF in the last decade. A cost-of-service analysis for

this facility (including bond payment and operating costs) forecasts sewer rates at \$450 bimonthly for the 121 connections.

RESPONSE: Both the public and private sector have been strongly affected by the economic downturn, and staff has made several revisions to the monitoring requirements and technical reports schedule in an effort to minimize EID's operational costs. EID has an advantage over a community service district (CSD) that serves a single small community because EID serves several communities, and owns and operates several WWTFs. This allows EID to share the cost of administration and labor for operations among several communities. According to EID's website, the current sewer rate for a single family residence is \$81.20 per month, which is substantially higher than the 2007 statewide average sewer rate of \$34 per month for communities with fewer than 1,000 residents. However, the State Water Board's last rate survey is five years old, and the current statewide average is likely higher.

CENTRAL VALLEY CLEAN WATER ASSOCIATION's COMMENTS

CVCWA Comment No. 1: The tentative WDRs should be revised to reflect that the applicable water quality objective for electrical conductivity (EC) is a range, rather than 900 $\mu\text{mhos/cm}$. The narrative chemical constituents objective requires that waters designated as domestic or municipal supply meet the maximum contaminant levels (MCLs) specified in Title 22 of the California Code of Regulations. The State Water Board recognized in Order WQ 2009-0005, that the secondary MCLs for EC "consist of a *range* of values—recommended, upper, and short-term values." For EC, these values are 900 $\mu\text{mhos/cm}$, 1,600 $\mu\text{mhos/cm}$, and 2,200 $\mu\text{mhos/cm}$, respectively. In the same Order, the State Water Board compared the permittee's monitoring data for EC to the *upper* MCL. The Tentative Order should also be revised to clearly explain why the Central Valley Water Board has determined that it is appropriate to apply the lowest end of the range in this case versus some other appropriate value within the range.

RESPONSE: The proposed Order has been revised to address this comment. The rationale for setting the effluent and groundwater limits is discussed further in the response to EID Comment Nos. 1, 2, and 3. With regard to Order WQ-2009-005, the fact that the State Water Board compared the permittee's effluent EC to the upper MCL in one case does not imply that it is appropriate to do so in all cases. The proposed Order appropriately considers all potentially applicable water quality goals in setting site-specific water quality objectives.

CVCWA Comment No. 2: the Tentative Order includes an average monthly effluent limitation of 600 $\mu\text{mhos/cm}$. CVCWA is concerned that this was based on the Tulare Lake Basin Plan's effluent limitation of 500 $\mu\text{mhos/cm}$ over source water. The theory that 500 $\mu\text{mhos/cm}$ over source water is a "typical" domestic increase is not supported or studied, and it does not take into account current water conservation practices and required water conservation mandates for 2020.

RESPONSE: This comment is addressed in the response to EID Comment No. 2. With regard to the latter part of the comment, CVWCA is uniquely positioned to provide a service to the Board by conducting a comprehensive, region-wide survey of effluent salinity with attention to local differences due to type of treatment and disposal employed (some systems encourage evapoconcentration of salts); water supply hardness (which encourages the use of water softeners); and the prevalence of water conserving plumbing fixtures (which would have more of an effect in areas that have had significant recent development).